

## ABSTRACT

A method of forming a high  $f_{MAX}$  deep submicron MOSFET, comprising the following steps of. A substrate having a MOSFET formed thereon is provided. The MOSFET having a source and a drain and including a silicide portion over a gate electrode. A first ILD layer is formed over the substrate and the MOSFET. The first ILD layer is planarized to expose the silicide portion over the gate electrode. A metal gate portion is formed over the planarized first ILD layer and over the silicide portion over the gate electrode. The metal gate portion having a width substantially greater than the width of the silicide portion over the gate electrode. A second ILD layer is formed over the metal gate portion and the first ILD layer. A first metal contact is formed through the second ILD layer contacting the metal gate portion, and a second metal contact is formed through the second and first ILD layers contacting the drain completing the formation of the high  $f_{MAX}$  deep submicron MOSFET. Whereby the width of the metal gate portion reduces  $R_g$  and increases the  $f_{MAX}$  of the high  $f_{MAX}$  deep submicron MOSFET.